

Applicant is unable to find in Jones et al. (Jones) at least one emitter having an “implanted” oxide layer.

Jones has in Fig. 24 an “overlayer” 408 and in Fig. 25 an “overlayer” 409. As the name “overlayer” implies and as shown in Fig. 24 and Fig. 25, both of the overlayers 408 and 409 of Jones are coated or deposited over emitter tip 406. For example, in Fig. 23 and in column 15, lines 53-55, Jones refers that the emitter tip (tip 362 in Fig. 23) may be optionally “coated” with a low work function material. In column 17, lines 31-36, Jones refers that the optional overlayer 408 may be formed by evaporating approximately 1000-1500 Angstroms of silicon monoxide “over” the emitter tip (not embedded or implanted in the emitter tip). In column 17, lines 47-53, Jones refers that overlayer 408 of Fig. 24 is replaced by overlayer 409 “on” the emitter tip and by layer 411 “surrounding” the base of the emitter column. Applicant respectfully submits that overlayer 409 and layer 411 are not implanted or embedded in the emitter tip. Jones mentions several methods such as evaporation, directional sputtering, or ion beam deposition for forming overlayer 409 and layer 411. Applicant is unable to find in Jones either a showing or a fair suggestion that overlayer 408, overlayer 409, or layer 411 is implanted or embedded in the emitter tip. In contrast, claim 1 recites, among other things, at least one emitter having an “implanted” oxide layer for releasing electrons at a predetermined energy level. Accordingly, Applicant requests that the rejection of claim 1 be reconsidered and withdrawn and that claim 1 and dependent claim 2 be allowed.

Independent claim 3 recites, among other things, at least one emitter having an “implantation” for releasing electrons at a predetermined energy level. Applicant is unable to find in Jones et al. (Jones) at least one emitter having an “implantation”. Jones has overlayers 408 and 409. Applicant is unable to find in Jones either a showing or a fair suggestion that overlayers 408 and 409 being an implantation layer in the emitter. In contrast, overlayers 408 and 409 are formed “over” or “on” the emitter tip as explained in details in the discussion of claim 1. Accordingly, Applicant requests that the rejection of claim 3 be reconsidered and withdrawn and that claim 3 be allowed.

Independent claim 5 recites, among other things, at least one emitter having an “implantation” for releasing electrons at a predetermined energy level. Applicant is unable to find in Jones et al. (Jones) at least one emitter having an “implantation”. Jones has overlayers

408 and 409. Applicant is unable to find in Jones either a showing or a fair suggestion that overlayers 408 and 409 being an implantation layer in the emitter. In contrast, overlayers 408 and 409 are formed “over” or “on” the emitter tip as explained in details in the discussion of claim 1. Accordingly, Applicant requests that the rejection of claim 5 be reconsidered and withdrawn and that claim 5 be allowed.

Independent claim 7 recites, among other things, at least one emitter having an “implantation” for releasing electrons at a predetermined energy level. Applicant is unable to find in Jones et al. (Jones) at least one emitter having an “implantation”. Jones has overlayers 408 and 409. Applicant is unable to find in Jones either a showing or a fair suggestion that overlayers 408 and 409 being an implantation layer in the emitter. In contrast, overlayers 408 and 409 are formed “over” or “on” the emitter tip as explained in details in the discussion of claim 1. Accordingly, Applicant requests that the rejection of claim 7 be reconsidered and withdrawn and that claim 7 be allowed.

Independent claim 9 recites, among other things, at least one emitter having an “implantation” for releasing electrons at a predetermined energy level. Applicant is unable to find in Jones et al. (Jones) at least one emitter having an “implantation”. Jones has overlayers 408 and 409. Applicant is unable to find in Jones either a showing or a fair suggestion that overlayers 408 and 409 being an implantation layer in the emitter. In contrast, overlayers 408 and 409 are formed “over” or “on” the emitter tip as explained in details in the discussion of claim 1. Accordingly, Applicant requests that the rejection of claim 9 be reconsidered and withdrawn and that claim 9 be allowed.

Independent claim 11 recites, among other things, at least one emitter having an “implantation” for releasing electrons at a predetermined energy level. Applicant is unable to find in Jones et al. (Jones) at least one emitter having an “implantation”. Jones has overlayers 408 and 409. Applicant is unable to find in Jones either a showing or a fair suggestion that overlayers 408 and 409 being an implantation layer in the emitter. In contrast, overlayers 408 and 409 are formed “over” or “on” the emitter tip as explained in details in the discussion of claim 1. Accordingly, Applicant requests that the rejection of claim 11 be reconsidered and withdrawn and that claim 11 be allowed.

Independent claim 13 recites, among other things, at least one emitter having an “ion implantation layer” for releasing electrons at a predetermined energy level. Applicant is unable to find in Jones et al. (Jones) at least one emitter having an “ion implantation layer”. Jones has overlayers 408 and 409. Applicant is unable to find in Jones either a showing or a fair suggestion that overlayers 408 and 409 being an implantation layer in the emitter. In contrast, overlayers 408 and 409 are formed “over” or “on” the emitter tip as explained in details in the discussion of claim 1. Accordingly, Applicant requests that the rejection of claim 13 be reconsidered and withdrawn and that claim 13 and dependent claim 14 be allowed.

Independent claim 15 recites, among other things, at least one emitter having an “implantation layer” for releasing electrons at a predetermined energy level. Applicant is unable to find in Jones et al. (Jones) at least one emitter having an “implantation layer”. Jones has overlayers 408 and 409. Applicant is unable to find in Jones either a showing or a fair suggestion that overlayers 408 and 409 being an implantation layer in the emitter. In contrast, overlayers 408 and 409 are formed “over” or “on” the emitter tip as explained in details in the discussion of claim 1. Accordingly, Applicant requests that the rejection of claim 15 be reconsidered and withdrawn and that claim 15 be allowed.

Independent claim 17 recites, among other things, at least one emitter having an “implantation layer” for releasing electrons at a predetermined energy level. Applicant is unable to find in Jones et al. (Jones) at least one emitter having an “implantation layer”. Jones has overlayers 408 and 409. Applicant is unable to find in Jones either a showing or a fair suggestion that overlayers 408 and 409 being an implantation layer in the emitter. In contrast, overlayers 408 and 409 are formed “over” or “on” the emitter tip as explained in details in the discussion of claim 1. Accordingly, Applicant requests that the rejection of claim 17 be reconsidered and withdrawn and that claim 17 and dependent claim 18 be allowed.

Independent claim 19 recites, among other things, at least one emitter having an “implantation layer” for releasing electrons at a predetermined energy level. Applicant is unable to find in Jones et al. (Jones) at least one emitter having an “implantation layer”. Jones has overlayers 408 and 409. Applicant is unable to find in Jones either a showing or a fair suggestion that overlayers 408 and 409 being an implantation layer in the emitter. In contrast, overlayers 408 and 409 are formed “over” or “on” the emitter tip as explained in details in the

discussion of claim 1. Accordingly, Applicant requests that the rejection of claim 19 be reconsidered and withdrawn and that claim 19 be allowed.

Independent claim 21 recites, among other things, at least one emitter having an “implantation layer” for releasing electrons at a predetermined energy level. Applicant is unable to find in Jones et al. (Jones) at least one emitter having an “implantation layer”. Jones has overlayers 408 and 409. Applicant is unable to find in Jones either a showing or a fair suggestion that overlayers 408 and 409 being an implantation layer in the emitter. In contrast, overlayers 408 and 409 are formed “over” or “on” the emitter tip as explained in details in the discussion of claim 1. Accordingly, Applicant requests that the rejection of claim 21 be reconsidered and withdrawn and that claim 21 and dependent claim 22 be allowed.

Independent claim 23 recites, among other things, at least one emitter having a “silicon oxide ion implantation layer”. Applicant is unable to find in Jones et al. (Jones) at least one emitter having a “silicon oxide ion implantation layer”. Jones has overlayers 408 and 409. Applicant is unable to find in Jones either a showing or a fair suggestion that overlayers 408 and 409 being a silicon oxide ion implantation layer in the emitter. In contrast, overlayers 408 and 409 are formed “over” or “on” the emitter tip as explained in details in the discussion of claim 1. Accordingly, Applicant requests that the rejection of claim 23 be reconsidered and withdrawn and that claim 23 be allowed.

Independent claim 24 recites, among other things, at least one emitter having an “oxide implantation layer”. Applicant is unable to find in Jones et al. (Jones) at least one emitter having an “oxide ion implantation layer”. Jones has overlayers 408 and 409. Applicant is unable to find in Jones either a showing or a fair suggestion that overlayers 408 and 409 being an oxide implantation layer in the emitter. In contrast, overlayers 408 and 409 are formed “over” or “on” the emitter tip as explained in details in the discussion of claim 1. Accordingly, Applicant requests that the rejection of claim 24 be reconsidered and withdrawn and that claim 24 be allowed.

Independent claim 25 recites, among other things, at least one emitter having an “embedded silicon oxide layer”. Applicant is unable to find in Jones et al. (Jones) at least one emitter having an “embedded silicon oxide layer”. Jones has overlayers 408 and 409. Applicant is unable to find in Jones either a showing or a fair suggestion that overlayers 408 and 409 being

an embedded silicon oxide layer in the emitter. In contrast, overlayers 408 and 409 are formed “over” or “on” the emitter tip as explained in details in the discussion of claim 1. Accordingly, Applicant requests that the rejection of claim 25 be reconsidered and withdrawn and that claim 25 and dependent claim 26 be allowed.

**Claims 3, 5, 7, 9, 11, 13-15, 17-19, 21, 22, and 33-36 were rejected under 35 USC § 102(e) as being anticipated by Zimlich (U.S. Patent No. 6,130,106).** Applicant respectfully traverses.

Independent claim 3 recites, among other things, at least one emitter having an implantation in which the implantation is “conforming to an entire surface” of the at least one emitter.

Applicant is unable to find in Zimlich at least one emitter having an implantation in which the implantation is “conforming to an entire surface” of the at least one emitter.

Zimlich has, in FIG. 3 and in column 2, lines 57-65, an emitter 36 having a top portion or tip 38 stacked on top a base below tip 38. Tip 38 and the base of emitter 36 are formed after etching a layer 34 (not labeled in the drawings). The Office Action compares layer 34 to the implantation of claim 3. However, layer 34 of Zimlich *is* the emitter 36 (including tip 38 and the base), which is exposed and is not implanted or embedded in any surface of the emitter. In contrast, claim 3 recites an implantation “conforming to an entire surface” of the at least one emitter. Accordingly, Applicant requests that the rejection of claim 3 be reconsidered and withdrawn and that claim 3 be allowed.

Independent claim 5 recites, among other things, at least one emitter having an implantation in which the implantation is “conforming to an entire surface” of the at least one emitter. As explained in details the discussion of claim 3, Applicant is unable to find in Zimlich at least one emitter having an implantation in which the implantation is “conforming to an entire surface” of the at least one emitter. Accordingly, Applicant requests that the rejection of claim 5 be reconsidered and withdrawn and that claim 5 be allowed.

Independent claim 7 recites, among other things, at least one emitter having an implantation in which the implantation is “conforming to an entire surface” of the at least one emitter. As explained in details the discussion of claim 3, Applicant is unable to find in Zimlich at least one emitter having an implantation in which the implantation is “conforming to an entire

surface” of the at least one emitter. Accordingly, Applicant requests that the rejection of claim 7 be reconsidered and withdrawn and that claim 7 be allowed.

Independent claim 9 recites, among other things, at least one emitter having an implantation in which the implantation is “conforming to an entire surface” of the at least one emitter. As explained in details the discussion of claim 3, Applicant is unable to find in Zimlich at least one emitter having an implantation in which the implantation is “conforming to an entire surface” of the at least one emitter. Accordingly, Applicant requests that the rejection of claim 9 be reconsidered and withdrawn and that claim 9 be allowed.

Independent claim 11 recites, among other things, at least one emitter having an implantation in which the implantation is “conforming to an entire surface” of the at least one emitter. As explained in details the discussion of claim 3, Applicant is unable to find in Zimlich at least one emitter having an implantation in which the implantation is “conforming to an entire surface” of the at least one emitter. Accordingly, Applicant requests that the rejection of claim 11 be reconsidered and withdrawn and that claim 11 be allowed.

Independent claim 13 recites, among other things, at least one emitter having an ion implantation layer in which the ion implantation layer is “conforming to an entire surface” of the at least one emitter. As explained in details the discussion of claim 3, Applicant is unable to find in Zimlich at least one emitter having an ion implantation layer in which the ion implantation layer is “conforming to an entire surface” of the at least one emitter. Accordingly, Applicant requests that the rejection of claim 13 be reconsidered and withdrawn and that claim 13 and dependent claim 14 be allowed.

Independent claim 15 recites, among other things, at least one emitter having an implantation layer in which the implantation layer is “conforming to an entire surface” of the at least one emitter. As explained in details the discussion of claim 3, Applicant is unable to find in Zimlich at least one emitter having an implantation layer in which the implantation layer is “conforming to an entire surface” of the at least one emitter. Accordingly, Applicant requests that the rejection of claim 15 be reconsidered and withdrawn and that claim 15 be allowed.

Independent claim 17 recites, among other things, at least one emitter having an implantation layer in which the implantation layer is “conforming to an entire surface” of the at least one emitter. As explained in details the discussion of claim 3, Applicant is unable to find in

Zimlich at least one emitter having an implantation layer in which the implantation layer is “conforming to an entire surface” of the at least one emitter. Accordingly, Applicant requests that the rejection of claim 17 be reconsidered and withdrawn and that claim 17 and dependent claim 18 be allowed.

Independent claim 19 recites, among other things, at least one emitter having an implantation layer in which the implantation layer is “conforming to an entire surface” of the at least one emitter. As explained in details the discussion of claim 3, Applicant is unable to find in Zimlich at least one emitter having an implantation layer in which the implantation layer is “conforming to an entire surface” of the at least one emitter. Accordingly, Applicant requests that the rejection of claim 19 be reconsidered and withdrawn and that claim 19 be allowed.

Independent claim 21 recites, among other things, at least one emitter having an implantation layer in which the implantation layer is “conforming to an entire surface” of the at least one emitter. As explained in details the discussion of claim 3, Applicant is unable to find in Zimlich at least one emitter having an implantation layer in which the implantation layer is “conforming to an entire surface” of the at least one emitter. Accordingly, Applicant requests that the rejection of claim 21 be reconsidered and withdrawn and that claim 21 and dependent claim 22 be allowed.

Independent claim 33 recites, among other things, at least one emitter having an implantation layer in which the implantation layer is “conforming to an entire surface” of the at least one emitter. As explained in details the discussion of claim 3, Applicant is unable to find in Zimlich at least one emitter having an implantation layer in which the implantation layer is “conforming to an entire surface” of the at least one emitter. Accordingly, Applicant requests that the rejection of claim 33 be reconsidered and withdrawn and that claim 33 and dependent claims 34-35 be allowed.

Independent claim 36 recites, among other things, at least one emitter having an implantation layer in which the implantation layer is “conforming to an entire surface” of the at least one emitter. As explained in details the discussion of claim 3, Applicant is unable to find in Zimlich at least one emitter having an implantation layer in which the implantation layer is “conforming to an entire surface” of the at least one emitter. Accordingly, Applicant requests that the rejection of claim 36 be reconsidered and withdrawn and that claim 36 be allowed.

**§103 Rejection of the Claims**

**Claims 4, 6, 8, 10, 12, 16, and 20 were rejected under 35 USC § 103(a) as being unpatentable over Jones et al. ).** Applicant respectfully traverses for at least the following reasons.

Claims 4, 6, 8, 10, 12, 16, and 20 depend on their respective independent claims 3, 5, 7, 9, 11, 15, and 19. As discussed above in section *102 Rejection of the Claims*, independent claims 3, 5, 7, 9, 11, 15, and 19 are patentable over Jones. Thus, claims 4, 6, 8, 10, 12, 16, and 20 are also patentable over Jones because they depend on patentable claims. Accordingly, Applicant requests that the rejection of claims 4, 6, 8, 10, 12, 16, and 20 be reconsidered and withdrawn and that claims 4, 6, 8, 10, 12, 16, and 20 be allowed.

**Claims 4, 6, 8, 10, 12, 16, and 20 were rejected under 35 USC § 103(a) as being unpatentable over Zimlich.** Applicant respectfully traverses for at least the following reasons.

Claims 4, 6, 8, 10, 12, 16, and 20 depend on their respective independent claims 3, 5, 7, 9, 11, 15, and 19. As discussed above in section *102 Rejection of the Claims*, independent claims 3, 5, 7, 9, 11, 15, and 19 are patentable over Zimlich. Thus, claims 4, 6, 8, 10, 12, 16, and 20 are also patentable over Zimlich because they depend on patentable claims. Accordingly, Applicant requests that the rejection of claims 4, 6, 8, 10, 12, 16, and 20 be reconsidered and withdrawn and that claims 4, 6, 8, 10, 12, 16, and 20 be allowed.

**Claims 1, 2, and 23-26 were rejected under 35 USC § 103(a) as being unpatentable over Zimlich in view of Goodman et al. (U.S. Patent No. 5,311,055).** Applicant respectfully traverses for at least the following reasons.

Independent claim 1 recites, among other things, at least one emitter having an implanted oxide layer in which the implanted oxide layer is “conforming to an entire surface” of the at least one emitter.

Applicant is unable to find in Zimlich or in Zimlich and Goodman et al. at least one emitter having an implanted oxide layer in which the implanted oxide layer is “conforming to an entire surface” of the at least one emitter.

Zimlich has, in FIG. 3 and in column 2, lines 57-65, an emitter 36 having a top portion or tip 38 stacked on top a base below tip 38. Tip 38 and the base of emitter 36 are formed after



etching a layer 34 (not labeled in the drawings). The Office Action compares layer 34 to the implantation of claim 3. However, layer 34 of Zimlich *is* the emitter 36 (including tip 38 and the base), which is exposed and is not implanted or embedded in any surface of the emitter. In contrast, claim 3 recites an implantation “conforming to an entire surface” of the at least one emitter. Accordingly, Applicant requests that the rejection of claim 1 be reconsidered and withdrawn and that claim 1 and dependent claim 2 be allowed.

Independent claim 23 recites, among other things, at least one emitter having a silicon oxide ion implantation layer in which the a silicon oxide ion implantation layer is “conforming to an entire surface” of the at least one emitter. As explained in details in the discussion of claim 1, Applicant is unable to find in Zimlich or in Zimlich and Goodman et al. at least one emitter having a silicon oxide ion implantation layer in which the a silicon oxide ion implantation layer is “conforming to an entire surface” of the at least one emitter. Accordingly, Applicant requests that the rejection of claim 23 be reconsidered and withdrawn and that claim 23 and dependent claim 24 be allowed.

**Claims 27-32 were rejected under 35 USC § 103(a) as being unpatentable over Zimlich in view of Doan et al. (U.S. Patent No. 5,372,973).** Applicant respectfully traverses for at least the following reasons.

Independent claim 27 recites, among other things, at least one emitter having an external coating and an embedded layer in which the embedded layer is “conforming to an entire surface” of the at least one emitter.

Applicant is unable to find in Zimlich or in Zimlich and Doan et al. at least one emitter having an external coating and an embedded layer in which the embedded layer is “conforming to an entire surface” of the at least one emitter.

Zimlich has, in FIG. 3 and in column 2, lines 57-65, an emitter 36 having a top portion or tip 38 stacked on top a base below tip 38. Tip 38 and the base of emitter 36 are formed after etching a layer 34 (not labeled in the drawings). The Office Action compares layer 34 to the implantation of claim 3. However, layer 34 of Zimlich *is* the emitter 36 (including tip 38 and the base), which is exposed and is not implanted or embedded in any surface of the emitter. In contrast, claim 3 recites an embedded layer “conforming to an entire surface” of the at least one

emitter. Accordingly, Applicant requests that the rejection of claim 27 be reconsidered and withdrawn and that claim 27 be allowed.

Independent claim 28 recites, among other things, at least one emitter having an external coating and an embedded layer in which the embedded layer is “conforming to an entire surface” of the at least one emitter. As explained in details in the discussion of claim 27, Applicant is unable to find in Zimlich or in Zimlich and Doan et al. at least one emitter having an external coating and an embedded layer in which the embedded layer is “conforming to an entire surface” of the at least one emitter. Accordingly, Applicant requests that the rejection of claim 28 be reconsidered and withdrawn and that claim 28 be allowed.

Independent claim 29 recites, among other things, at least one emitter having an external coating and an embedded layer in which the embedded layer is “conforming to an entire surface” of the at least one emitter. As explained in details in the discussion of claim 27, Applicant is unable to find in Zimlich or in Zimlich and Doan et al. at least one emitter having an external coating and an embedded layer in which the embedded layer is “conforming to an entire surface” of the at least one emitter. Accordingly, Applicant requests that the rejection of claim 29 be reconsidered and withdrawn and that claim 29 be allowed.

Independent claim 30 recites, among other things, at least one emitter having an external coating and an embedded layer in which the embedded layer is “conforming to an entire surface” of the at least one emitter. As explained in details in the discussion of claim 27, Applicant is unable to find in Zimlich or in Zimlich and Doan et al. at least one emitter having an external coating and an embedded layer in which the embedded layer is “conforming to an entire surface” of the at least one emitter. Accordingly, Applicant requests that the rejection of claim 30 be reconsidered and withdrawn and that claim 30 be allowed.

Independent claim 31 recites, among other things, at least one emitter having an external coating and an embedded layer in which the embedded layer is “conforming to an entire surface” of the at least one emitter. As explained in details in the discussion of claim 27, Applicant is unable to find in Zimlich or in Zimlich and Doan et al. at least one emitter having an external coating and an embedded layer in which the embedded layer is “conforming to an entire surface” of the at least one emitter. Accordingly, Applicant requests that the rejection of claim 31 be reconsidered and withdrawn and that claim 31 be allowed.

Independent claim 32 recites, among other things, at least one emitter having an external coating and an embedded layer in which the embedded layer is “conforming to an entire surface” of the at least one emitter. As explained in details in the discussion of claim 27, Applicant is unable to find in Zimlich or in Zimlich and Doan et al. at least one emitter having an external coating and an embedded layer in which the embedded layer is “conforming to an entire surface” of the at least one emitter. Accordingly, Applicant requests that the rejection of claim 32 be reconsidered and withdrawn and that claim 32 be allowed.

**CONCLUSION**

Applicant respectfully submits that the claims are in condition for allowance, and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's representative at (612) 373-6969 to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

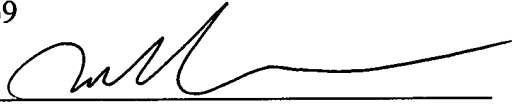
Respectfully submitted,

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Date October 19, 2004

By   
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